

CLAIMS

WHAT IS CLAIMED IS:

1. A process of forming an assembly, the method comprising:
5 providing a thermosettable material, the material being selected from a sheet molding compound, a bulk molding compound, a phenolic resin or a combination thereof;
molding the thermosettable material to form a carrier member;
applying an activatable material to a surface of the carrier member for forming a
10 reinforcement sealing or baffling member;
placing the reinforcement, sealing or baffling member within a cavity or adjacent to a surface of an article of manufacture, the cavity or surface being defined by one or more walls of a structure of the article of manufacture; and
activating the expandable material to form a foam that is adhered to the carrier
15 member and the surface or walls of the structure of the article of manufacture.
2. A process as in claim 1 wherein the thermosettable material includes a thermosettable resin that is based upon at least one of a polyester, a vinyl ester, an epoxy or a combination thereof.
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3. A process as in claim 2 wherein the thermosettable material is a molding compound and the thermosettable resin is between about 30% and about 60% by weight of the thermosettable material.
- 25 4. A process as in claim 2 wherein the thermosettable material includes a curing agent selected from a free radical initiator, an organometallic, an oxide catalyst, a peroxide catalyst, a polyhydric initiator or a combination thereof.
5. A process as in claim 2 wherein the thermosettable material includes a
30 reinforcement material selected from fiber, particulate, fabric, mat, cordage or combinations thereof.

6. A process as in claim 2 wherein the thermosettable material includes a fibrous reinforcement material selected from polymeric fibers, metal fibers, carbon fibers, graphite fibers, polyester fibers, glass fibers, silicon carbide fibers, alumina fibers, titanium fibers, steel fibers or combinations thereof.

7. A process as in claim 6 wherein greater than about 50% of the fibers have a length greater than about 1.5 inches.

8. A process as in claim 1 wherein the activatable material is an expandable material.

9. A process as in claim 1 wherein the step of molding the thermosettable material includes compressing the molding compound in a die.

10. A process as in claim 9 wherein the mold is heated to a temperature between about 200 °F and about 450 °F for molding the thermosettable material.

11. A process of forming a reinforced structural assembly in an automotive vehicle, the method comprising:

providing a thermosettable material, the material being a sheet molding compound that includes a thermosettable resin that is based upon at least one of a polyester or a vinyl ester;

molding the thermosettable material at an elevated temperature to form a carrier member by compressing the thermosettable material in a heated mold;

applying an activatable material to a surface of the carrier member for forming the reinforcement member wherein the step of applying the activatable material includes;

i) contacting the activatable material with the surface of the carrier member as a temperature of the carrier member declines from the elevated temperature achieved during the molding step, such

contacting thereby softening a portion of the activatable material with the heat of the carrier member to wet the surface of the carrier member; and

- ii) allowing the softened portion of the activatable material to harden and
5 adhere the activatable material to the carrier member; and

placing the reinforcement member within a cavity of a pillar structure of an automotive vehicle, the cavity being defined by one or more walls of the structure; and
activating the expandable material to form a structural foam that is adhered to the carrier member and the surface or walls of the structure of the automotive vehicle.

10 12. A process as in claim 11 wherein the activatable material is an expandable material and is applied to the carrier member as a plurality of shaped pieces.

15 13. A process as in claim 12 wherein the step of applying the activatable material to the carrier member further includes supporting the carrier member with a fixture.

20 14. A process as in claim 13 wherein the fixture include a support member and a support surface, the support surface including a plurality of cavities and wherein the contacting of the activatable material with the surface of the carrier member includes placing the plurality of shaped pieces into the plurality of cavities and supporting the carrier member upon the support member such that the pieces contact the surface of the carrier member.

25 15. A process as in claim 13 wherein the fixture includes one or more actuating arms and wherein the step of contacting the activatable material with the surface of the carrier member include supporting the pieces of activatable material on the one or more arms and actuating the arms to contact the pieces with the surface of
30 the carrier member.